

Spatial Temporal Reasoning – the Research Key to ST Math Success

More than 30 years of neuroscience research at the University of California, Irvine identified Spatial Temporal Reasoning as a valuable innate tool for mastering mathematics and developing problem solving skills.

Spatial Temporal Reasoning is every person's ability to solve multi-step problems by visualizing the components and processes in space and time, recognizing the structure of the problem, and then planning a sequence of steps to arrive at a solution.

Research also indicated that music training enhances spatial temporal abilities, and that spatial temporal computer lessons incorporating math principles might help students learn mathematics and develop problem solving skills.

In 1998, University of California, Irvine researchers Dr. Mark Bodner, Dr. Matthew Peterson and Dr. Gordon Shaw formed the MIND Institute, a non-profit organization. They recruited a small team to create a grade 2 math curriculum that consisted of a set of computer lessons in game format and music training on electronic piano keyboards.

Results from the first pilot site, 95th Street Elementary School in Los Angeles, validated the MIND team's theories. After one year of using ST Math, Stanford 9 test scores of participating students soared to the 65th percentile compared to non-participating students at the same school who scored at the 36th percentile.

"The MIND program is research-based and the results are quantifiable. It is vitally important that public schools implement programs whose validity and effectiveness are research-driven."

MARIAN BERGESON, FORMER CA SECRETARY OF EDUCATION

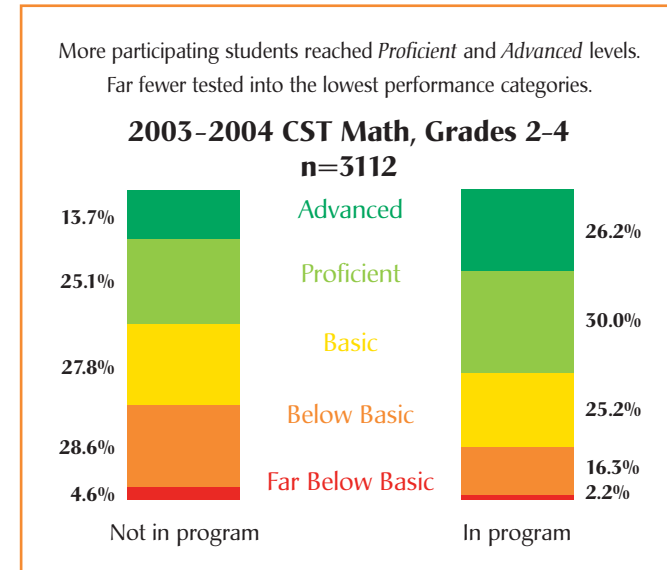
"Teachers and students cannot just work harder with incremental steps to achieve what we need in education today. We must make a paradigm shift in teaching methods to make a major step forward."

BILL HABERMEHL, SUPERINTENDENT OF SCHOOLS, ORANGE COUNTY, CA

Dramatic Math Success – for All Students

MIND's ST Math is now being used in more than 200 schools in 12 states. Over 8 years of research on student performance has consistently demonstrated that the program dramatically raises math performance at all levels of academic and English language proficiency. Multiple studies have shown the percent of participating students performing proficient and above on standardized tests is 20% higher than for non-participating peers.

Benefits Every Proficiency Level

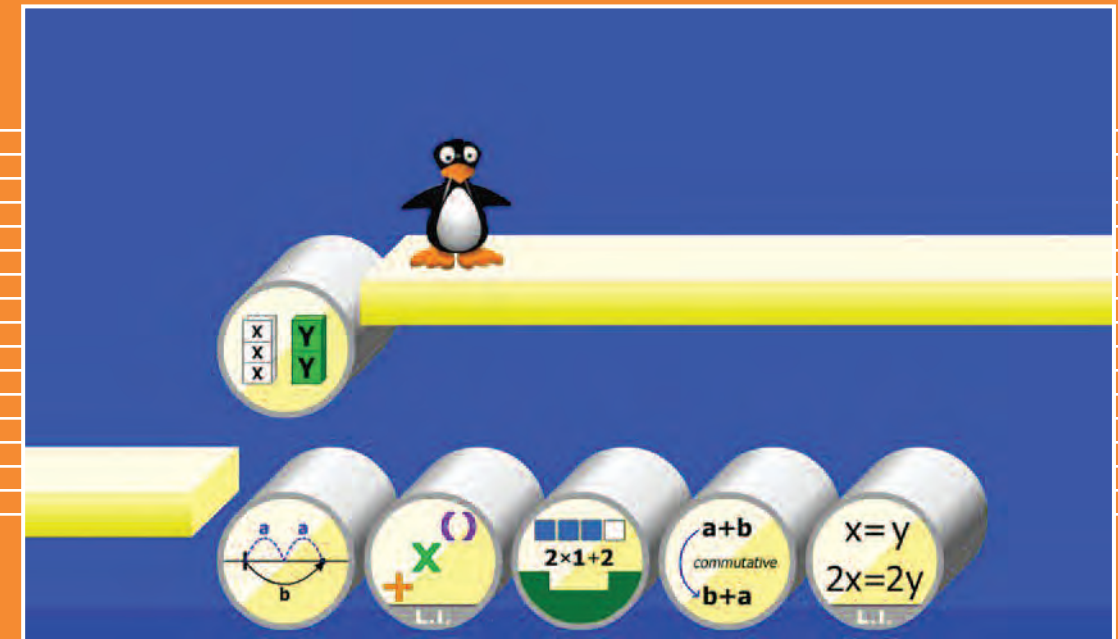


Tools for Professional Learning Teams

To ensure students master every ST Math concept at increasing levels of difficulty, the courseware provides embedded assessment with instant instructive feedback for students, and on-demand reports for teachers and school leadership teams.

Data gathered help schools set improvement goals for math and rigorously monitor progress toward them without cutting into valuable instructional time. This information immediately helps school teams identify timely interventions at student, classroom and school levels.

ST Math™ | Algebra Readiness



Spatial Temporal Math™: Algebra Readiness courseware is a comprehensive, systematic, supplemental program for middle school students and above that builds the foundational concepts and skills required for success in Algebra I.

MIND Research Institute

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www.mindresearch.net

The MIND Research Institute is dedicated to education program excellence and cutting edge scientific research. The support of individuals, corporations and foundations is essential to our success.

Research-driven Product Development

Dr. Matthew Peterson – MIND Research Institute cofounder and author of the program – and the MIND team are committed to ongoing product development and improvement through

- Formal education and scientific research
- Real-time studies of student use and results

MIND

Research Institute

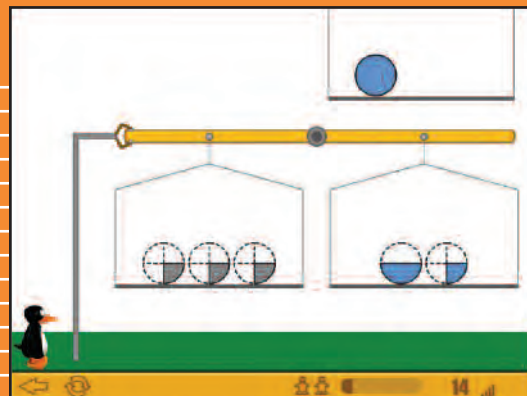
A non-profit organization

The ST Math™ Courseware

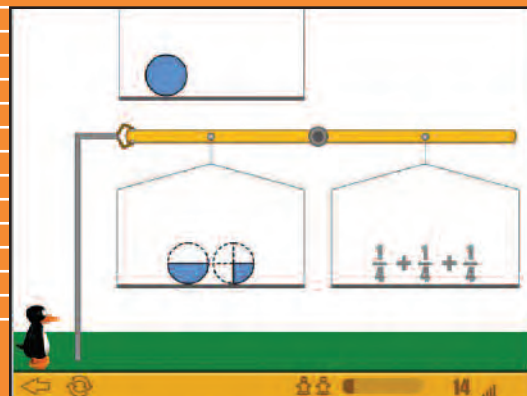
Removing Language Barriers to Learning Math

MIND's patented visual learning strategy makes ST Math: Algebra Readiness immediately helpful to English Language Learners and other students who have struggled to learn with traditional materials and methods.

The games are divided into two types: Spatial Temporal and Language Integration. Spatial Temporal games are language free and teach the math concepts using a visual, conceptual and problem solving approach. Language Integration (L.I.) games integrate key math language and symbols to help students make the transition from concepts they've learned in the courseware to the material they encounter in math textbooks and standardized tests.



Spatial Temporal



Language Integration

Games are visually intriguing and fun to play. The design is intuitive and self-starting, with no written or verbal instructions. Starting with a "tutorial," students learn by example the instructional objective and how to play each game.

Informing Instruction with Data-Driven Reports

Student progress through the curriculum is collected over the Internet. An online Teacher Console generates on-demand reports for monitoring the pace and performance of each student. Student, class and school reports help educators identify student difficulty in mastering standards and implement timely interventions.

A Powerful Intervention for Building Algebra Readiness

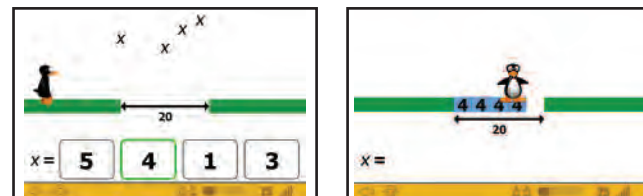
ST Math: Algebra Readiness consists of visual computer games in strategically sequenced modules of instruction for building the foundational math skills most critical for success in Algebra I. The courseware is designed to supplement traditional math instruction with systematic computer-based intervention.

Games promote mastery-based learning and mathematical understanding through integrated development and practice of concepts, skills and applied problem solving. The interactive learning platform addresses individual needs with engaging game strategies that motivate even the most disengaged learners.

Self-Paced Learning with Instructive Feedback

As with all MIND ST Math products, virtually no prerequisites are required for success with the games. Students progress at their own pace. To win the games, students must solve problems and learn the math. Initial problems, intentionally simple, ensure immediate success. Each game progresses through increasing levels of difficulty until students attain mastery of the target concept.

A friendly penguin, JiJi, plays a central role in the games. The consistent goal is to help JiJi cross the computer screen. Students must correctly solve a problem that also removes an obstacle in JiJi's path. By design, students want to help JiJi – their inspiration and mentor – who provides immediate instructive feedback on both correct and incorrect answers. This interaction with JiJi helps students gain confidence, master the concepts and win the games.



The algebra problem " $4X=20$, solve for X " is here represented graphically. There are 4 " X " variables in the sky. What value does each need to be to create a 20 wide bridge, fill the gap, and allow JiJi to cross?

After the student selected an incorrect solution of "4," the answer animated and turned each X into a 4-wide bridge – not long enough in sum to fill the gap. This immediate, visual, functionally meaningful feedback provides a key to learning.

The Key to Algebra Readiness

Rebuilding the Foundation

ST Math: Algebra Readiness was developed in response to the national crisis of students failing algebra in middle schools, and inspired by the call from California for a new core course in Algebra Readiness. This latest product in the ST Math family supports the Algebra Readiness assumption that algebra success is dependent on a strong foundation of basic arithmetic skills which many middle school students have not built.

MIND developers recognized that the proven visual, foundational approach used in MIND's elementary courseware presented an ideal way to help struggling secondary students master the essential building blocks for algebra success. Unlike traditional pre-algebra programs, the courseware provides a powerful visual learning path to algebra readiness from a basic level of math facts up through introductory algebraic equations.

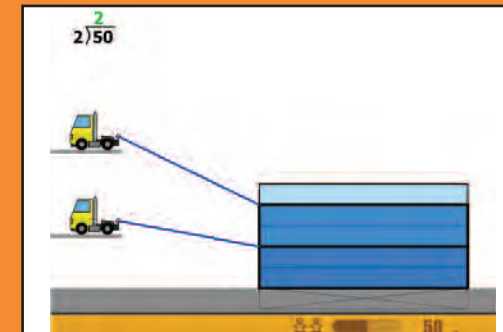
ST Math: Algebra Readiness gives teachers a flexible tool for preparing students before they enter an Algebra I class, or for providing intervention to students already struggling with algebra.

ST Math Algebra Readiness Content:

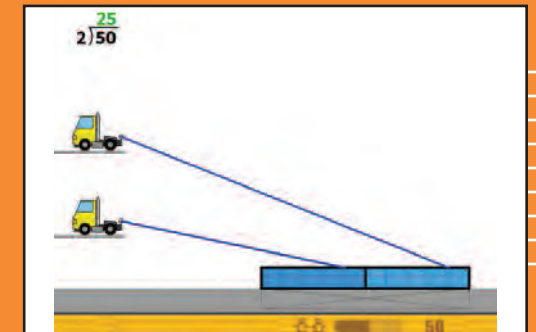
- The Number Line
- Variables
- Place Value
- Long Division
- Rates and Ratios
- Proportional Relationships
- Fractions, Decimals and Percents
- Negative Numbers
- Operations on Rational Numbers
- Exponents
- Word Problems
- The Coordinate Plane
- Linear Equations
- Factorization

In this game, students are visually shown the concept of long division.

The blocks represent the dividend (50), and the trucks represent the divisor (2).



Screen shot 1: 2 10-block groups for each truck



Screen shot 2: 2 groups of 5 blocks for each truck

Implementation

Rapid Start Up and Ongoing Proactive Support

Classroom teachers are able to implement the ST Math courseware after one day of training. Site-dedicated MIND trainers provide ongoing professional development and proactive implementation assistance including help with interpretation of progress reports and appropriate intervention strategies.



Flexible Purchase and Implementation Plans

Schools supply the computers, either Macintosh or PCs. Software and other support materials that correspond to state math standards are supplied by the MIND Research Institute.

Purchase plans are designed to meet specific school needs. Schools may choose to implement during the regular school day or in after school or summer programs. The recommended school day schedule for use of ST Math: Algebra Readiness is 45 minutes once a week.

The program may be purchased as an annual subscription or as a perpetual license. All purchase plans include training and ongoing professional and technical support.

"My association with MIND has been one of the most influential aspects of my 33 years of teaching. The support Del Obispo School has received during installation, implementation, and follow-up has been unprecedented by any program I have used."

PATTY KINGSTON, TEACHER, CAPISTRANO UNIFIED SCHOOL DISTRICT, CA